TnT MINES LIMITED

ABN 67 107 244 039

EL4/2011

RINGAROOMA BAY SOUTH

ANNUAL REPORT TO 03 JANUARY 2013

Russell Fulton
TNT Mines Limited
Level 2, 34 Colin St
West Perth WA 6872

ABSTRACT

TNT Mines has acquired six exploration licences in Ringarooma Bay in north-east Tasmania to explore for offshore placer tin. Historical drilling and offshore geophysical work has indicated the presence of significant amounts of alluvial tin both on and at shallow depths beneath the sea floor.

A desktop scoping study showed that a cutter suction tin dredging operation on the current JORC Indicated Resource of 16Mm^3 at 0.227 kgm^3 tin would be marginal at a tin price of $20,000 per tonne. TNT Mines intends to carry out a geophysical test work program comprised of sidescan sonar, pinger and boomer acoustic sub-bottom profiling, detailed bathymetry and marine gradiometer surveys to define higher grade strand lines or palaeochannels to be followed up by vibracore drill sampling. No field work was carried out on the tenement this year.

CONTENTS

FIGURES

1.0 INTRODUCTION

The ancestral Ringarooma River has deposited alluvial tin and other heavy minerals into what is now Ringarooma Bay. Previous exploration work, predominantly in the late 1960s through to the 1980s has demonstrated the presence of potentially economic tin mineralisation within the palaeochannels and terraces associated with the submerged river. A previous explorer estimated a JORC Indicated Resource of $16Mm^3$ at $227g/m^3$ of tin and a larger Inferred Resource of $194Mm^3$ at $150\text{-}250g/m^3$. The resource lies within water depths in the bay of 5-25m and further into Bass Strait the tenements cover water depths of up to 40m.

Modern exploration drilling techniques can comfortably drill in these water depths using vibracoring techniques to obtain samples of the unconsolidated tin bearing sediments to allow TNT Mines to confirm the JORC resource and rapidly evaluate the potential for additional higher grade 'tin leads' in the offshore sediments. There is also prospectivity for zircons, sapphires, and other heavy minerals.

The alluvial mineralisation would be amenable to a cutter suction dredging operation using "off the shelf" equipment similar to that used in south-east Asian tin dredging operations

1.1 Location and tenure

Ringarooma Bay is located in the north eastern tip of Tasmania (Figure 1). It forms a broad semi-circular bay which faces broadly north towards Bass Strait. It is flanked to the east by Cape Portland and to the west by Waterhouse Point and Waterhouse Island. The bay is fringed predominantly by white sandy beaches, with several small intervening headlands, such as at Tomahawk on the western side of the bay.

Much of the land area surrounding the bay is managed by agricultural practices, with most coastal plains having been heavily modified by agriculture (grazing and dairy). The landforms consist of sandy floodplains, sand dunes, lagoons and wetlands. The latter occur along a line parallel to the shore. Several reserves and Ramsar wetlands occur near Ringarooma Bay.

Published bathymetric contours of Ringarooma Bay show that the bay consists of roughly even contours to depths of around 30 metres below mean sea level. Linear depressions occur which represent palaeochannels from the Ringarooma River.

The area around Ringarooma Bay is home to a small population occupied predominantly with farming-related activities (sheep, cattle, dairy, grain, etc). Tourism is also a significant seasonal input to the region, with between half to two thirds of the private dwellings not being permanently occupied, and having the potential to accommodate holidaying visitors.

EL4/2011 was granted on 04/01/2012 for Mineral Categories 1 and 5 and covers an area of 24 km^2. The tenement is one of six tenements that make up the Ringarooma Bay Project.

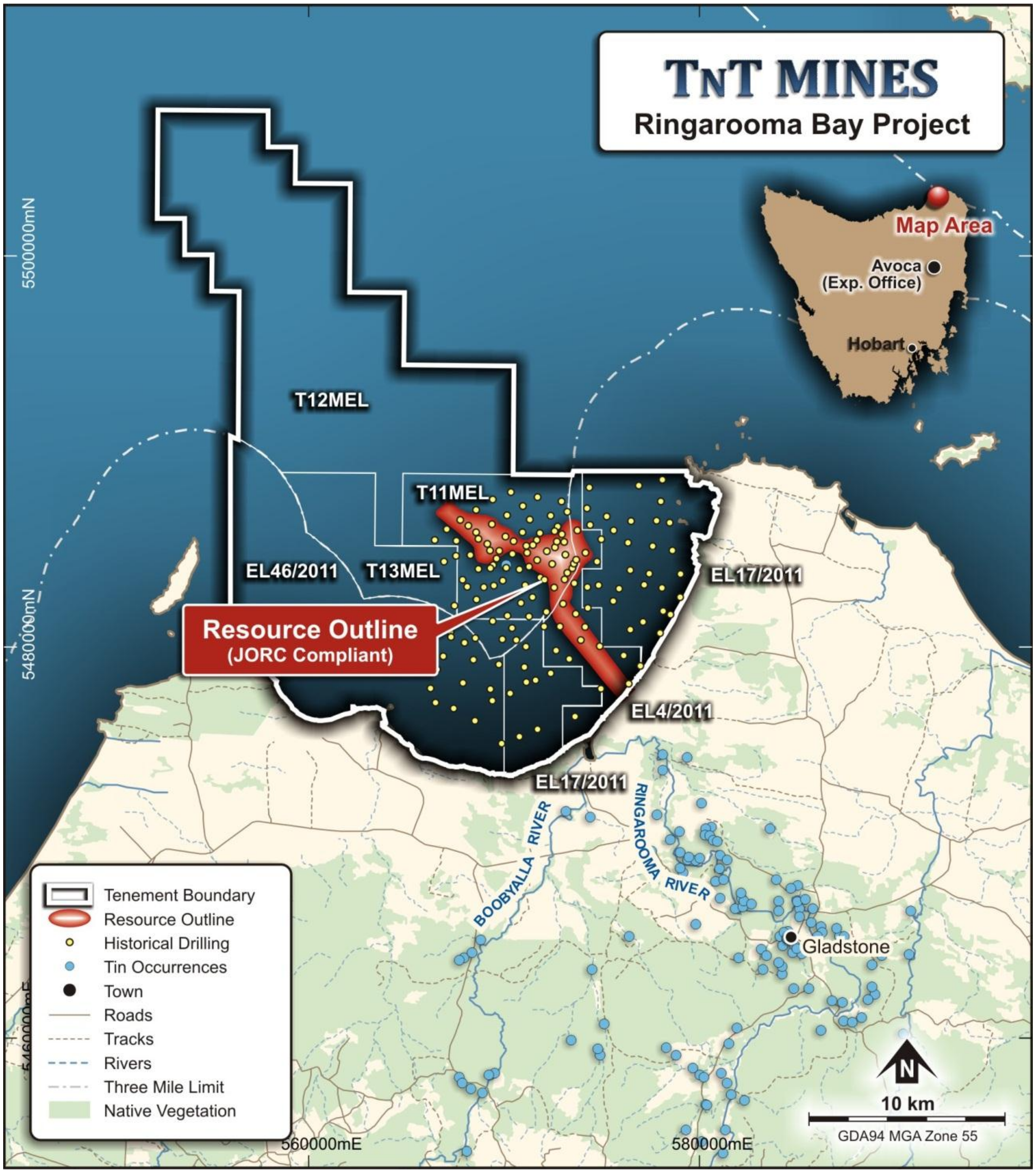

Figure 1: Location plan of Ringarooma Project tenements

1.2 Geology overview

TNT Mines' projects in northeast Tasmania are located within the Eastern Tasmanian Terrane.

The pre-Carboniferous geology of northeast Tasmania is dominated by a folded and faulted package of early possibly Cambrian - Ordovician to Devonian turbidites, the Mathinna Supergroup, into which several batholiths of both I-type and S-type granite have intruded.

The Mathinna Supergroup typically comprises fining-up Bouma sequences of less than two metres thickness and have been subdivided into two associations; an older shale-dominated succession to the west and a younger shale-sandstone succession. The older one has experienced an extra deformation which has produced recumbent folding suggesting a

faulted or unconformable contact with the younger succession which displays upright, open to closed folding resulting from two Devonian deformations. Gold mineralisation is associated with Devonian deformation and magmatism.
Three separate composite I-type and S-type granitoid batholiths intrude the Mathinna Supergroup rocks at relatively high crustal levels and are composed of hornblende-biotite granodiorite, biotite granite/adamellite and alkali feldspar granite. There is a statistical compositional trend towards more felsic, fractionated granite and monzogranite with decreasing age and a regional westward younging across northern Tasmania.

Tin and tungsten mineralisation is associated predominantly with strongly fractionated alkali-feldspar granites and includes tin greisens at Anchor and Royal George and quartz vein tin and tungsten deposits at Aberfoyle and Storey's Creek.

Mathinna Supergroup and granitic rocks are unconformably overlain by relatively flat-lying Permo-Triassic sediments, the Parmeener Supergroup, into which sills of Jurassic dolerite have been intruded. Uplift and faulting is associated with basaltic volcanism in the Tertiary and placer cassiterite deposits formed in parts of northeast Tasmania, including Ringarooma Bay. Minor sedimentation followed in Pleistocene to Recent times producing extensive lowland plains, coastal deposits and dunes typically consist of Quaternary and Tertiary materials overlain by sandy soils'

Local Geology

The geology around Ringarooma Bay (Figure 2) consists broadly of the following units:

- Ordovician Mathinna Group micaceous greywacke turbidite sequences;
- Devonian adamellite granite;
- Permian glaciomarine sequences of mudstone, pebbly mudstone and sandstone, minor limestone and Tasmanite oil shale;
- Jurassic dolerite with locally developed granophyre;
- Tertiary basalt and associated pyroclastic rocks; and
- Quaternary coastal sand, mud and gravel of lacustrine and littoral origin.

There are only minor occurrences of the Ordovician greywacke and the Permian glaciomarine sequences in the area. The Tertiary basalt and associated pyroclastic rocks have only been mapped on the eastern portion of Cape Portland. The Devonian adamellite-granite forms a significant part of Waterhouse Point and the bedrock in other inland areas around the south of Ringarooma Bay. The Jurassic Dolerite forms significant parts of the bedrock in eastern areas of Ringarooma Bay and outcrops on the western side of Cape Portland and other headlands and islands west of Cape Portland, including Petal Point. The Tomahawk area and headland also consists of Jurassic Dolerite.

A veneer of Quaternary sand, mud and gravel sediments has covered much of the older rocks, with deposition occurring through lacustrine, fluvial, littoral wave and wind action. Flood plain deposits occur along the drainage lines and in particular the Ringarooma River flood plain. Extensive dune fields have developed. Dune crests are typically oriented along a roughly east-west axis, with the exception of the coastal dune line perpendicular to the shore along the bay.

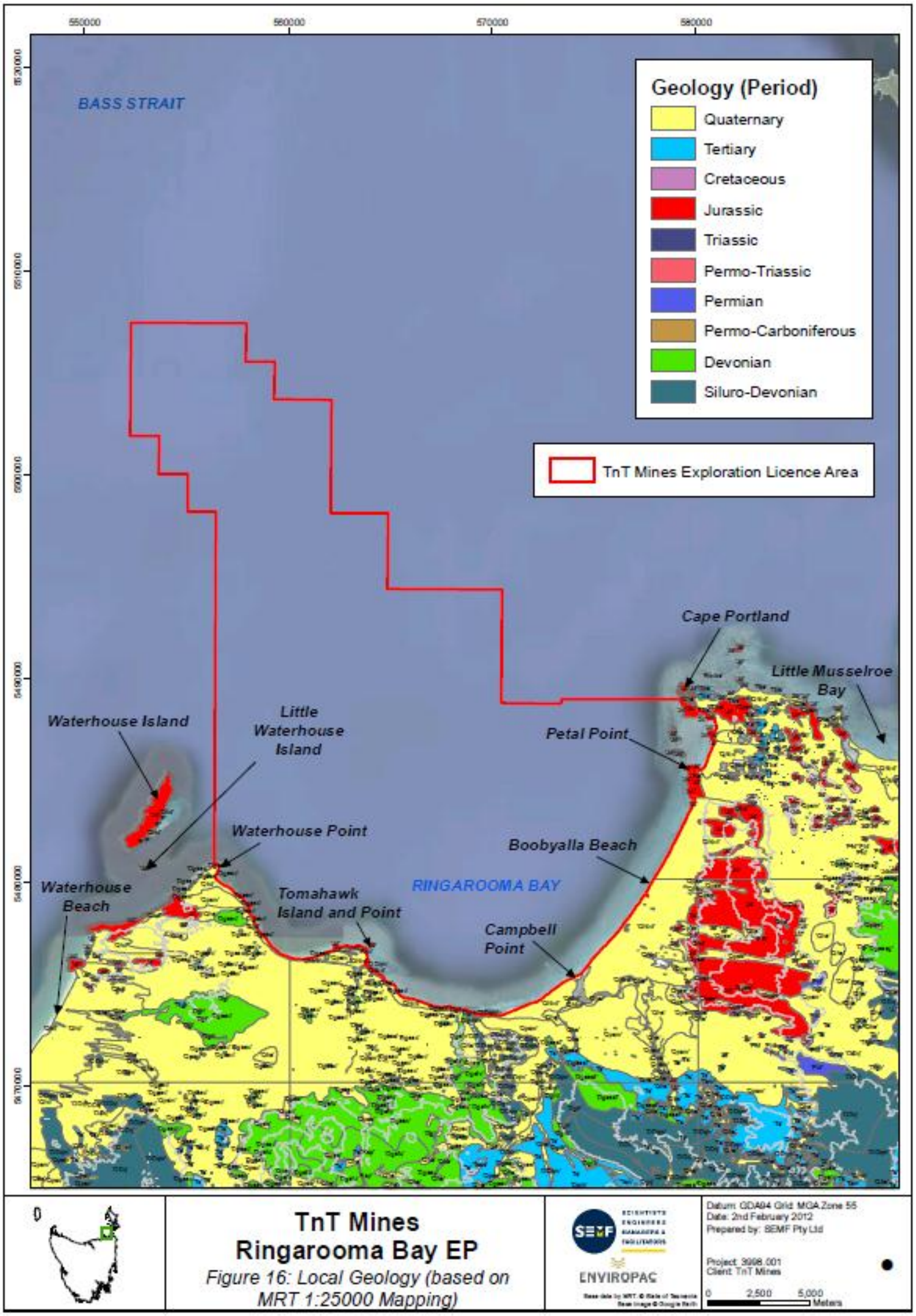

Figure 2: Onshore geology in Ringarooma area

Seabed Composition (from Keresue-Ponte, in prep)
The near-shore bathymetry of Ringarooma Bay has been mapped as part of the Seamap Tasmania – Mapping the Gaps Project (Lucieer et al. 2009). The project included mapping the seabed composition, within 1.5km of the shore, including distribution of cobble, reef, sand and seagrass. The report (Lucieer et al. 2009) notes that their acoustic mapping method made it difficult to distinguish between cobble and seagrass, particularly due to the intermixed nature of these habitats at the 1:25,000 mapping scale used, as such, it was 'impossible' to cartographically represent these habitats using linear boundaries.

The following can be noted:

- *reef and cobble dominate the 1.5km zone at either end of Ringarooma Bay, i.e. from Foster Islands and Cape Portland to Baynes Island, at the eastern end, and the area west, northwest, and northeast of Waterhouse Island, at the western end, with sand occurring only in restricted patches;*
- *a small reef area occurs around Petal Point;*
- *the eastern half of the Bay between Petal Point and Boobyalla Inlet is dominated almost exclusively by sand in the 1.5km zone from the coast; this also included the Ringarooma River lower floodplain with the RAMSAR site;*
- *from Boobyalla Inlet, west to Waterhouse Point, the seafloor is dominated by sand and seagrass, with some cobble areas and a range of small isolated reefs, including west of Murdoch's Beach (west of the Boobyalla Inlet), and at Tomahawk Point.*

The sand has been characterised as 'fine sand' (Lucieer et al. 2009). The reefs in the area were reported as predominantly 'low profile'.

Mineral Deposits (from Keresue-Ponte, in prep)
The following offshore minerals deposits summary is based on Mason (2000).

TIN

- *the tin wash commonly lies directly on the seabed or with less than 2 m of cover;*
- *MHA has defined an area of 4 sq km containing shallow alluvials with high concentrations of tin up to a maximum of 694 g/t of tin, using 100 g/t cut off – this area is interpreted to correspond to reworked placers which have formed a thin and wide blanket perpendicular to the palaeochannel and parallel to the shore, likely along an old strand line;*
- *Less frequently, tin wash occurs under up to 10m of cover; this is more common deeper in the bay;*
- *The best grades are in medium to coarse sands to fine gravels, often with well-rounded granules or pebbles to 75mm diameter. Many of the richest intersections are underlain by a sticky silt/clay bottom. This may correspond to the onshore "Marine Bottom" or may be a false bottom.*
- *In comparison with most alluvials where the grade decreases away from sources the tenor of the offshore tin wash, of 150 to 250 g/cu.m, is not significantly different from the onshore sheet wash.*

SAPPHIRE
Sapphire concentrations in the offshore environment are uncertain, but it is considered that the main channel could contain high quality stones as they are potentially extensions of the known concentrations in the onshore areas.

HEAVY MINERALS

- *Ilmenite and rutile: recent offshore exploration by Mineral Holdings Australia (MHA) has defined a zone of higher concentrations of heavy mineral sands associated with* *the “Near Shore Sediment” build-up. This represents a palaeo shore line, 500m to 2km from the present shore.*

- *Zircon concentrations are more wide spread than ilmenite, and are associated with both the tin and the other heavy mineral sand concentrations.*

Duncan et al (2002) associated the tin placers in Ringarooma Bay with the palaeochannel of the Ringarooma River and considered the plateau structure in Ringarooma Bay, which hosts most of the indicated resource, to be an ancient strand line formed at a time of stable sea level by reworking of the palaeochannel deposits, which have formed an east-west trending resource.

1.3 Exploration Rationale

There has been a significant body of work done over several decades on potential mineral deposits within Ringarooma Bay. Tin resources are known for the bay. Furthermore, the bay also hosts other minerals of commercial value. One of the main reasons the resources have not already been mined, or have not been defined in more detail, is because of high upfront costs of carrying out the work in a marine environment.

Exploration drilling activities were carried out predominantly between 1966 and 1968 and this sampling formed the basis for the estimation of a JORC Inferred Resource in 2000. The resource is estimated to comprise approximately 194Mm^3 with a concentration of 150-250g/m^3 of tin (with approximately 29,100 – 48,500t of contained). The Indicated Resource is in the order of 16Mm^3 at 227g/m^3 of tin. The resource area (see Figure 1) also contains zircon, ilmenite, rutile, and other potential commodity minerals. The extent and locations of past exploration drilling is also shown in Figure 1.

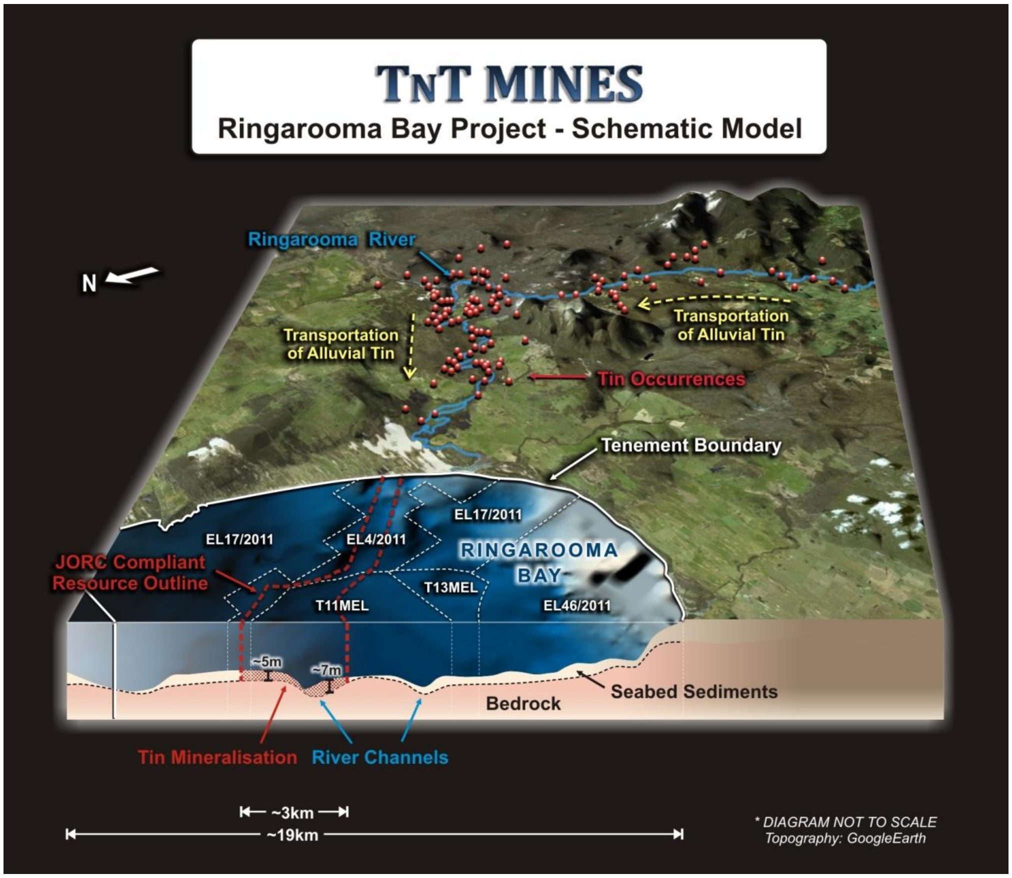

Figure 3: Schematic model – Ringarooma Bay

Although past exploration results are encouraging, additional information is required on the resource in order to develop the project. In particular, it is necessary to better evaluate the resource from an economic, metallurgical, and mining feasibility perspective.

To this end, TNT Mines proposes to carry out geophysical and sediment sampling surveys for the purpose of better defining the extent and characteristics of alluvial tin and heavy minerals resources within Ringarooma Bay.

Advances in both geophysical and soft sediment sampling techniques have been substantial since the early exploration of Ringarooma Bay 40 years ago. In particular, the availability of low energy sub-bottom acoustic profiling techniques such as pinger and boomer, side-scan sonar, marine magnetometry and differential GPS accuracy make it possible to construct accurate profiles of the soft sediment stratigraphy and maps of seafloor bathymetry that are vastly more detailed and accurate. The delineation of high grade strand lines and palaeochannel deposits is crucial to the success of TNT Mines venture.

2.0 REVIEW OF PREVIOUS WORK

The inland area south of Ringarooma Bay is a well-known alluvial tin province which has produced in excess of 40,000 t of tin since discovery in the 1870's, from mines such as the Briseis, Arba, Pioneer, Endurance and others.

Tin-rich minerals have also been transported by river over millions of years from the tin-bearing rocks surrounding Ringarooma Bay and upstream of the Ringarooma River. Tin-rich alluvial sediments transported by the Ringarooma River settled within the Pleistocene course of the river which is now partly submerged beneath Ringarooma Bay. Tin-bearing minerals also occur along buried or submerged strandlines within the bay, parallel to the current coastline.

A number of exploration companies have carried out mineral exploration activities in Ringarooma Bay since 1966. A summary of this work is provided below, extracted from Bucci et al (2012).

- Between 1966-1968, Tasmanian Offshore Exploration Company (TOEC) conducted a regional bathymetric, seismic and sampling programme, followed by a 138-hole drilling programme in the areas of interest. Of these holes, TOEC considered that 27 holes yielded encouraging mineralised intervals. Sixteen of the holes had "*grades over their total depths*" above a cut-off grade of 75 g/m^3 Sn. The grades of the 192 analysed samples ranged from 37 to 815 g/m^3 Sn (Featherstone 2011 and references therein);
- In 1968, Utah Development Corporation together with BHP drilled 15 holes to 18 m water depth up to 4.3 km offshore. The best intervals included 2 holes that were drilled within 600m of shores and contained averaged grades of 50 to 85 g/m^3 Sn (Featherstone 2011 and references therein);
- In 1981-1982, Hellyer Mining and Exploration Pty Ltd (Hellyer) completed a programme of bathymetric, seismic and magnetic surveys and a review of works completed by TOEC;
- In 1983, Conzinc Riotinto of Australia Exploration Pty Ltd (CRAE) undertook a review of the works completed by the previous owners and concluded that the quantum of mineralisation in the area ranged 14-21 MCM @ 175 – 200 g/m^3 (Mason 2000 and references therein);
- In 1995, Mineral Holdings Australia Pty Ltd completed a "pre-feasibility review" of the historic works (Macarthur 1995). In 2000, the review was updated by Mason (2000). Based on the historic drilling data by TOEC, and geophysical surveys undertaken by Hellyer, Mason (2000) re-estimated the quantum of mineralisation in the Project area and concluded that the major palaeo-channel and four other prospects together host up to 199 MCM @150-250g/m^3 Sn of "*inferred materials*", which included 16 MCM @ 227g/m^3 Sn of "*indicated Resource*". In addition to the potential tin mineralisation, Mineral Holdings considered the Project area might have potential of containing gemstone quality sapphire, and economic concentrations of rutile, zircon and ilmenite. Mason (2000) concluded that the area is prospective for a large scale dredging operation.

3.0 WORK COMPLETED DURING THE REPORTING PERIOD

3.1 Environmental

3.2.1 Environmental plan for exploration

An environmental plan for exploration is in preparation and excerpts from the plan have been used in this technical report. The plan is being prepared by SEMF Pty Ltd (SEMF) with input from TNT Mines. The plan should be completed in early 2013.

3.2.2 EPBC referral

SEMF advised TNT Mines that it would be prudent to lodge an EPBC referral (under the *Environment Protection and Biodiversity Protection Act* 1999 (EPBC Act)) with the Commonwealth for proposed exploration work in Ringarooma Bay. The referral was recommended on the basis of potential impacts on Matters of National Environmental Significance (MNES). The EPBC Act applies to seven MNES:

a. World heritage sites;
b. National heritage places;
c. Wetlands of international importance (including Ramsar wetlands);
d. Nationally threatened species and ecological communities;
e. Migratory species;
f. Commonwealth marine areas;
g. Nuclear actions.

TNT's proposed exploration work has the potential to impact on NES matters d, e, and f, and possibly even c, due to the nearby Ramsar wetlands. The EPBC referral should be finalised in early in 2013.

3.2 High level scoping

A basic desktop study with indicative CAPEX and OPEX for Ringarooma Bay was prepared by Roger Bastone of Vanston Pty Ltd in August. Roger has extensive experience in alluvial tin operations in south-east Asia including working for PT Koba Tin in Indonesia. The report is included as Appendix 1.

Figure 4: Cutter suction dredge operating in south-east Asia

4.0 DISCUSSION OF RESULTS

4.1 Environmental

4.1.1 Environmental plan for exploration

The plan has yet to be completed.

4.1.2 EPBC referral

The EPBC referral has not been assessed yet.

4.1 High level scoping

The purpose of the study was to gain a “ball park” idea of the economics of a dredging operation in Ringarooma Bay. The desk-top scoping study used the current JORC Indicated Resource and suggests that although CAPEX would be relatively low, a higher grade or higher tin prices would be desirable. The conclusions from Bastone’s study are included below:

> *Based on the limited information available there are sufficient Indicated Resources (16Mm3 at 0.227kg/m3) to establish a four year dredging operation at 500m3/hour or 3.6Mm3/year. If further exploration activity upgrades the Inferred Resources there is opportunity for more than one dredge unit to operate in the area*
>
> *Alternatively a smaller dredge unit 300m3/hour or 2.2Mm3/year could be considered in the Indicated Resource area at marginally lower capital and operating cost. In this case dredging income would be available over a seven year timeframe during which time further exploration could be undertaken. However the lower throughput in low grade ground and therefore lower production would not be sufficiently offset by cost savings and the operating profit at the lower tin price of AUD$20000 would at best be marginal.*
>
> *The recommended mining option is a cutter suction unit. A 500m3.hour unit operating for 20 hours/day would mine 3.6Mm3 per annum and produce 816 tonnes of tin assuming a recovery on bore value of 100% and a grade of 0.22kg/m3.*
>
> *Capex for setup would be in the order AUD$7.1M assuming a new self-propelled dredge was purchased with an on board concentrating plant, associated work boats, a wharf, breakwater and onshore office facility.*
>
> *Operating profit from the sale of wet ore at 74%tin in concentrates would be in the order of AUD$3.0M/annum before overheads, tax, interest and royalties; assuming a wet concentrate sale price of AUD$14800 on an LME Tin Price of AUD$20000/Tonne.*
>
> *Cost/m3 mined would be in the order of $2.*

5.0 CONCLUSIONS AND FUTURE WORK

The desk-top scoping study has shown that a dredging operation in Ringarooma Bay would be an essentially low capital cost operation but would require definition of a higher grade resource to ensure profitability. The exploration work that TNT Mines has planned in the first two years of the licence is designed to delineate high grade strand lines and palaeochannels.

The environment plan for exploration and EPBC referral should be finalised in early 2013. Field work is planned for March-April 2013. The field work planned is described below, extracted from Keresue (in prep).

Exploration work proposed by TNT Mines for Years 1 and 2 of the Exploration Licences will comprise:

- *an initial round of gravity coring and grab sampling;*
- *an initial remote sensing / geophysical survey stage; followed by*
- *another sampling stage, including drilling and grab sampling.*

*The remote sensing work will be undertaken from a vessel on Ringarooma Bay. The vessel will follow pre-determined survey lines, indicated in Figure 5***Figure***, which will overlap the known resource areas, and will include the use of:*

- *Multibeam echosounder;*
- *Side-scan sonar;*
- *Boomer*
- *Pinger;*
- *Magnetic gradiometer;*
- *GPS, tide gauge and barometer.*

Gravity coring will occur in the interpreted extension of the defined resource area. Sediment sampling locations will be chosen after the interpretation of the geophysical survey work has been completed. Placement of sampling locations will enable infill of previous historic sampling locations, and will also target those areas identified by the geophysical surveys to most likely contain tin and other economic minerals deposits. The sediment sampling methods proposed are as follows:

- *vibracore sampling (100 locations x 6m long x 75-100mm diameter cores);*
- *grab sampling (100 x 2-5L samples);*
- *gravity coring (120 x 1 to 1.5m long x 75mm diameter cores) and*
- *diver sampling (100 x 5L samples).*

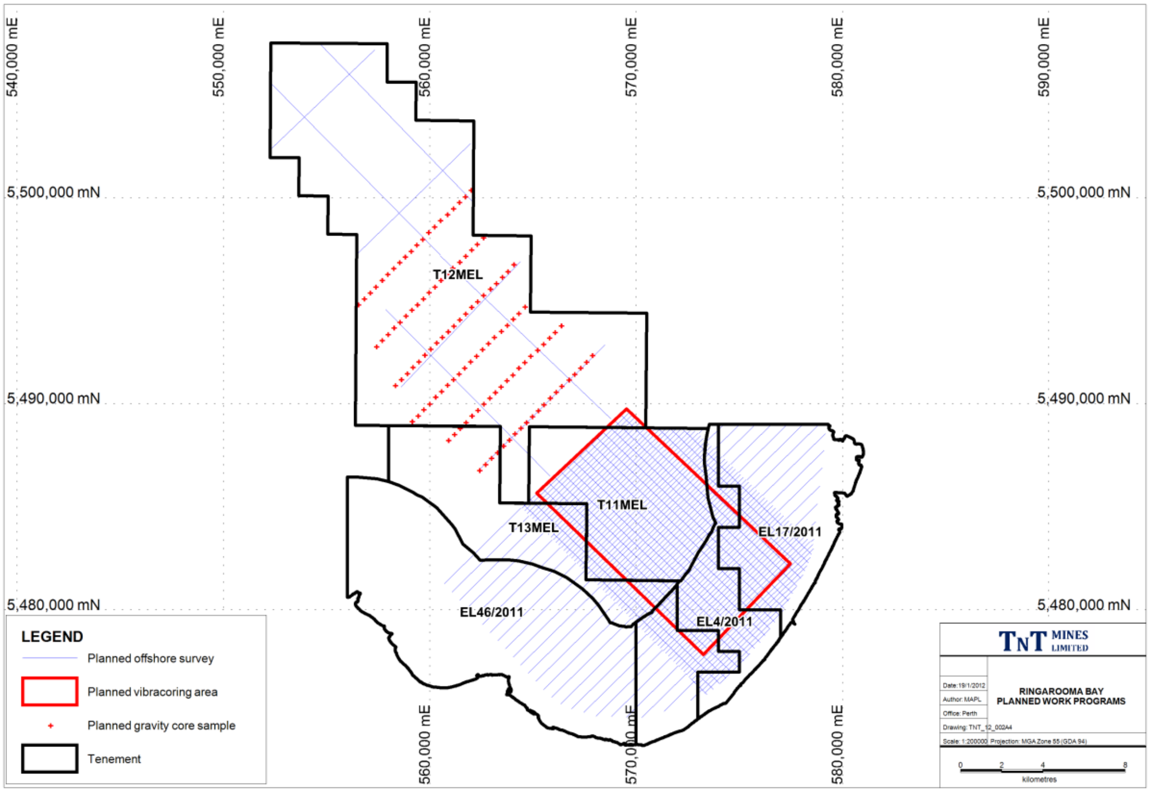

Figure 5: Indicative Location Map of Geophysical Survey Lines and Sampling

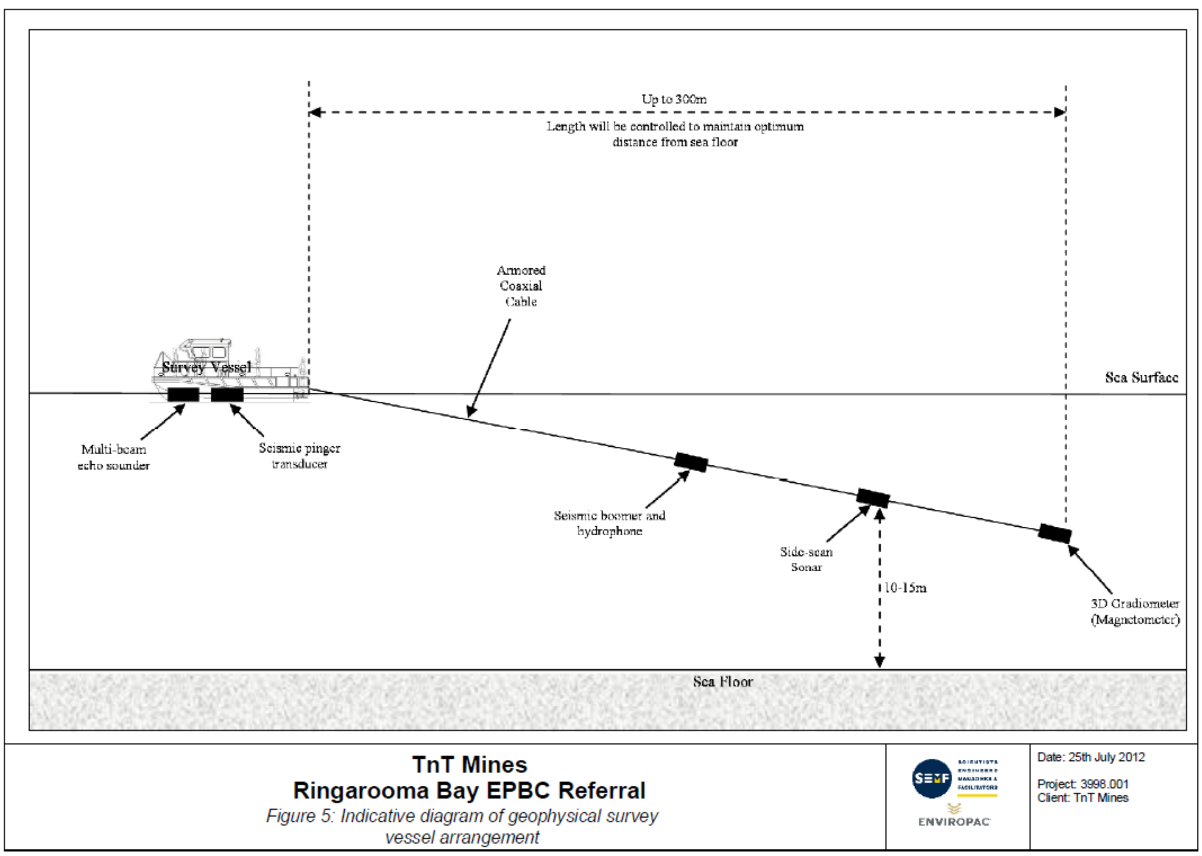

Figure 6: Indicative diagram of geophysical survey vessel arrangements

All subsequent testing, gravity separation, analysis and other determinations will be conducted on shore at suitably licensed laboratory facilities.

Indicative locations of gravity coring sampling and survey lines (based on the current inferred extent of the resources) are indicated in Figure 5. As noted above, vibracoring, grab and diver sampling locations will need to be informed by geophysical survey interpretations and may therefore be modified prior to being carried out.

Geophysical Survey

The geophysical survey will be undertaken by experienced marine geophysicists, and hydrographic surveyors using a specially equipped vessel.

The following equipment will be used during the survey:

- *A tide gauge will be deployed underwater at Ringarooma Bay to monitor tidal levels to a defined datum for the duration of the survey operations; a calibrated barometer will be deployed to correct the tidal data for barometric pressure variations;*
- *Real Time geographic positioning system (GPS);*
- *Multibeam transducer: generates bathymetry data to measure the tidally corrected water depth. This will enable production of a highly accurate digital terrain model of the seafloor and a contour bathymetry map;*
- *Side-scan sonar: produces an aerial 'photograph' of the seafloor showing rock outcrops, different sediment types and shipwrecks or debris;*
- *Pinger transducer: generates sub bottom profiling data to approximately 10m depth into the unconsolidated sediments. This will enable a high resolution map of the upper sediments in the bay to be generated;*
- *Boomer: generates sub bottom profiling data to approximately 40m depth into the unconsolidated sediments. This will enable a map of the deeper geological layers and channels to be generated; and*
- *Magnetic Gradiometer: This will detect magnetic minerals such as magnetite which can be associated with the cassiterite and can be used as proxy data for ilmenite and cassiterite concentration.*

The side-scan sonar towfish will be towed on a 300m armoured cable approximately 10-15m above the seafloor. Both 100kHz and 500kHz data will be recorded.

The sub-bottom profiling survey will involve the collection of boomer and pinger profiling data at a combination of two different frequencies to enable collection of an accurate dataset. The pinger transducer will be hull-mounted whilst the boomer transducer and hydrophone array will be "tethered and towed" at a fixed distance behind the vessel.

The magnetic gradiometer will be towed behind the side-scan sonar using a tandem tow array and the magnetometer elevation off the seafloor will be controlled by adjusting the tow cable length using a sonar winch. Gradiometer positioning will be accomplished using an ultra short baseline (USBL) positioning system.

As well as providing an excellent dataset on bathymetry, seafloor vegetation coverage, sediment distribution, underlying geology and potential mineral resource distribution, the geophysical survey will also enable underwater hazards (e.g. rocky reefs or shipwrecks) to be identified prior to sediment sampling in the areas of interest.

An indicative vessel and equipment array is given in Figure 6.

Approximately 1000 line kilometres of geophysical surveying will be undertaken in consecutive lines parallel to the coast. Lines will begin approximately parallel to and at a distance of at least 500 metres from the coast and will then be spaced between 200 and 500 metres from each other (Figure 5). Between half to over ¾ of each of the licence areas will be covered by the geophysical survey lines.

The survey work will be undertaken during daylight hours at an estimated rate of approximately 40km per day. This will enable the survey to be completed over approximately 19 days. In inclement weather the survey may be delayed and the vessel may seek safe anchorage in Bell Bay or Ringarooma Bay. Weather permitting; the vessel will anchor at night in a safe area in the vicinity of Waterhouse Point or in the lee of Waterhouse Island.

The vessel will resupply with fuel, water, food and other survey requirements, in Bridport, Bell Bay or Whitemark (Flinders Island). Small supplies may also be brought in to the jetty at Tomahawk.

Sampling Methods

Figure 5 shows the proposed gravity core locations, proposed vibracoring area and the proposed geophysical survey lines. The following percent areas are covered with proposed exploration survey and sampling work within each licence:

- *EL4/2011: geophysical and vibracoring cover approximately 84% of the licence area;*
- *EL17/2011: geophysical and vibracoring cover approximately 79% of the licence area;*
- *EL46/2011: geophysical survey lines cover approximately 40% of the licence area;*
- *T11MEL: geophysical and vibracoring cover approximately 100% of the licence area, some of it with broad spaced geophysics;*
- *T12MEL: broad spaced geophysical and gravity coring cover approximately 90% of the licence area;*
- *T13/MEL: broad spaced and closed space geophysical and gravity- and vibracoring cover approximately 55% of the licence area.*

The details of these methods are provided in the following sub-sections.

Vibracore Sampling

Vibracore sampling will be undertaken using a vessel with an open back deck. The vessel will typically be equipped with an A-frame, winches, a crane and a four-point anchoring system. An example of a sampling vessel is given in Figure 7.

The vessel will position itself within 20m of the pre-determined drilling site. If the vessel has dynamic positioning capability, vibracoring will begin as described below. If the vessel has a four-point mooring system, this will be laid out over the site to ensure that the vessel doesn't drift offsite during the coring operation. It can take about two hours to set out the mooring system. Using this method it is estimated that 3 to 4 vibracores could be collected each day depending on the ground conditions and distance between sites.

Once the vessel is dynamically positioned or suitably anchored, the vibracoring unit is lowered into the ocean. The coring system comprises a 6.5m aluminium tripod fitted with a steel core barrel attached to a vibrating head. The hammer and core barrel rotate freely within the frame allowing the core barrel to penetrate difficult substrates.

The vibrating hammer (vibrohammer) operates at a variable frequency from 0 to 6000Hz enabling frequency to be matched with sediment types. A 75 to 100mm sediment core is extracted. Vibracore samples will be lifted intact with the barrel of the sampler to the deck of the vessel. The cores will then be stored upright to facilitate the drainage of water from the sediments prior to being extracted from the barrels and placed in core trays. An example of a deployed vibracoring unit is given in Figure 8.

No drilling fluids are used in the process of vibracoring. No drill cuttings or sediment discharge occurs during vibracoring; Figure provides an excerpt of a video taken from the operation of a vibracorer, showing that no sediment is discharged during the vibracoring process (a full video of the operation of a vibracorer is provided in digital format on the CD accompanying this EP).

The resulting drill hole is expected to slowly collapse onto itself as vibracoring will only penetrate through unconsolidated sediments. The unconsolidated sediment profile is expected to rapidly settle into the drill hole upon retraction of the vibracorer head and barrel. A minimal amount of turbidity will be generated immediately at the collar of the drill hole by the displacement of water from within the drill hole during infilling by surrounding sediments.

Figure 7: Example of a vessel equipped for vibracoring

Figure 8: Vibracorer being deployed

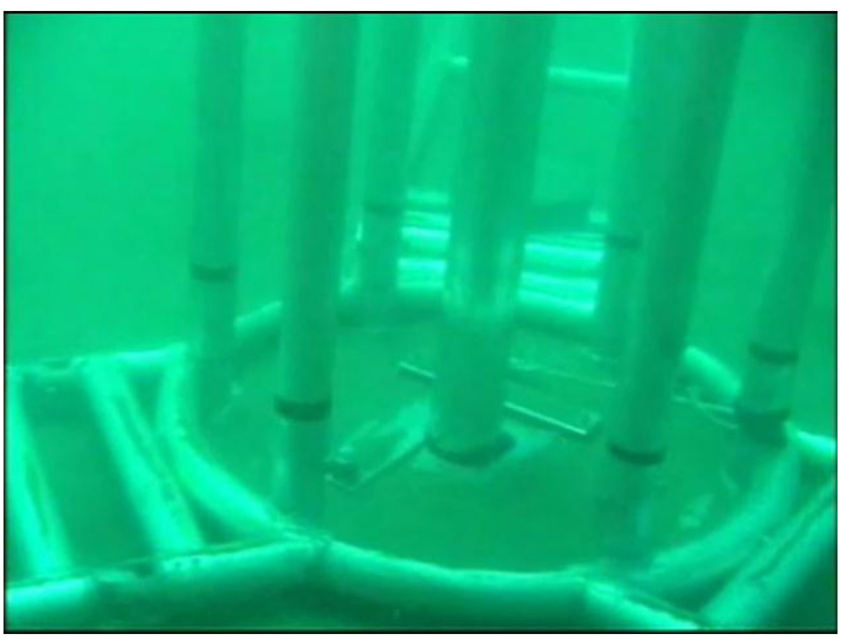

Figure 9: Underwater picture of vibracorer in operation
Source: vibracoring video by Marine GeoSolutions

The core trays will be stored on the vessel until demobilisation in port. The vibracorer will penetrate up to 6m and has a maximum diameter of 10 cm (=0.0078 m^2). Approximately 165 x 6 metre long samples will be taken. Sampling will be undertaken no closer than 500m from the shore. Where drilling penetration encounters refusal shallower than 4 metres depth, then an alternative nearby location will be drilled as a replacement drill hole.

At a rate of 3 to 4 vibracore samples per day. Sampling could take between 25 and 34 days. In inclement weather the survey may be delayed and the vessel may seek safe anchorage in Bell Bay or Ringarooma Bay. Weather permitting; the vessel will anchor at night in a safe area in the vicinity of Waterhouse Point or in the lee of Waterhouse Island.

The vessel will be resupplied with fuel, water, food and other survey requirements, in Bridport, Bell Bay or Whitemark (Flinders Island). Small supplies may also be brought in to the jetty at Tomahawk.

Total surface disturbance area from vibracoring will be approximately:

- *Drill hole areas: 165 x 0.0078 m^2 = 1.29 m^2*
- *Tripod areas: 3m x 0.5m x 3 = 4.5 m^2 x 165 locations = 742.5 m^2*
- *Anchor areas (if no dynamic positioning vessel is used): 0.5 m^2 x 2 x 165 = 165 m^2*

Total worst case disturbance area for 165 vibracore holes, with a vessel requiring anchoring at each location would be of the order of 910 m^2.

Vibracoring will occur predominantly within EL4/2011, EL17/2011 and T11MEL, with a few samples being in T13MEL, T12MEL and EL46/2011. The vibracore sampling grid will cover approximately 50% of EL4/2011, approximately 1/8th of EL17/2011, approximately ¾ of T11MEL, approximately 10% of T13MEL and a very small proportion of T12MEL and EL46/2011.

Grab Sampling

Grab samples will be collected using either a Van Veen or Shipek grab. The Shipek grab collects a 3.0L sample and the Van Veen collects a 20L sample in two bucket halves deployed from the boat by line and hauled back on board. The samples will be bagged on the vessel and will be taken ashore at vessel demobilisation. Approximately 220 samples will be taken.

Grab sampling will be undertaken at similar locations used for vibracoring and as a tool for assessing the geology and sediment composition across the project area.. Sampling would be undertaken a minimum of 500m from the shore.

The aim of these samples will be to better quantify and characterise the near surface resource concentrations within delineated target economic resource areas and to map the sea floor.

A Van Veen grab image is shown in Figure 10 and a Shipek grab being deployed from a vessel is shown in Figure 11.

Figure 10: Image of a Van Veen Grab sampling bucket

Figure 11: Image of a Shipek Grab being deployed from a vessel

Gravity Coring

Cores will be collected with the aid of a gravity corer. The corer samples are designed to test for the presence of tin further out into Bass Strait along the palaeochannel of the Ringarooma River. A total of around 120 core samples will be taken along six lines, two kilometres apart, with samples taken approximately 400m apart (refer to Figure 5). Another 100 gravity core samples will be taken across other parts of the project area, yet to be located exactly. The gravity corer equipment will be run off the same vessel as the geophysical survey work. Examples of gravity coring work are provided in Figure 12, Figure 13 and Figure 14.

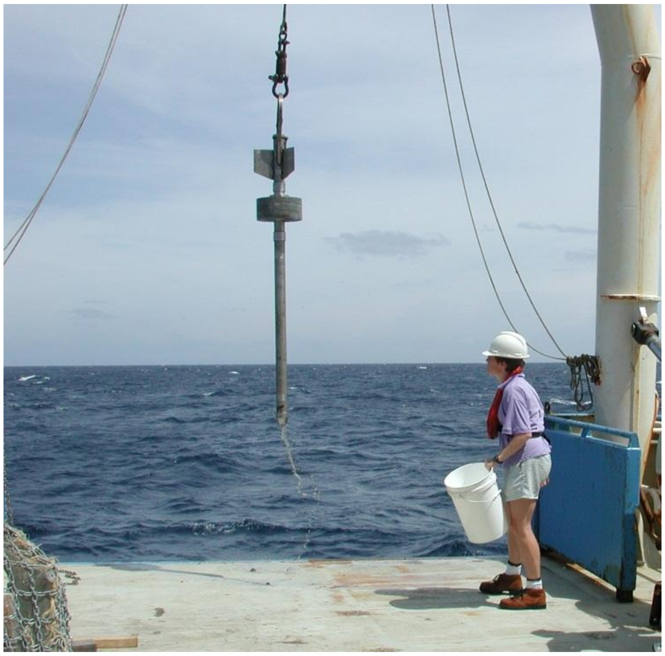

Figure 12: Gravity corer retrieval

Figure 13: Gravity corer disassembly for core removal

Figure 14: Gravity corer sample

Diver Sampling

Diver samples will be collected with a lower amount of disturbance in comparison to the grab sample and with more geological control over the sample medium. A 5L bucket would be filled with a scoop, capped and hauled to the surface. Approximately 100 samples will be taken.

Diver sampling may be undertaken using the same vessel used for gravity coring.

Sampling would be undertaken a minimum of 500m from the shore.

The aim of these samples will be to characterise the near surface geology and mineralogy of target economic resource units and to collect mineralised material for metallurgical studies.

Sample Handling

Vibracorer Core Samples

After completion of the survey, the cores will be discharged and transported to a suitable existing storage facility at TNT Mines' Avoca shed. Cores will be split (using a plasma cutter), sampled and photographed in high resolution. The unsampled half of the core will be stored in plastic core boxes, with a lid and labelled. The core boxes will remain in the Avoca shed, for reference during the project. The sampled half of the cores will be sent off to a laboratory for testing. The cores will be analysed to determine their sedimentology, grain size statistics, organic carbon content, carbonate content, mud content and mineralogy. Detailed core logs indicating sediment types, grainsize statistics, calcium carbonate contents, organic carbon contents, gravel contents, mud contents and geochemical analyses will be produced. Core samples will also undergo testing via physical separation with test gigs which will allow for heavy media separation and estimation of tin, zircon, titanium and other accessory mineral and metals concentrations.

Grab Samples

Samples will be allowed to drain off seawater prior to being bagged. All bagged samples will be stored on the vessel until its final return to port. Bagged samples will be sent to a laboratory for testing. The grab samples will undergo testing via physical separation with test gigs which will allow for heavy media separation and estimation of tin, zircon, ilmenite. rutile and other accessory mineral and metals concentrations.

Gravity Corer Cores

Cores retrieved from the gravity coring equipment will be handled and processed similarly to the vibracore samples described above.

Diver Bulk Samples

Diver bulk samples will be handled and tested similarly to the grab samples.

Drainage Water

Seawater draining out of core barrels, grab or diver samples on the deck of the vessel will be channelled to a sediment collection pit which will allow fines to settle prior to discharging the decanted seawater back to the sea. Sediment generation from the grab and diver bulk samples is expected to be minimal as the sampling locations will target the coarse fractions of the seabed and are therefore unlikely to shed much material during seawater drainage.

It is estimated that a sediment collection pit which could process up to 50L of fine sediment laden seawater may be required. This is based on the maximum daily coincident sampling case of:

- *4 core barrels / day x 3 L drainage per barrel +*
- *10 grab samples / day x 5 L drainage per grab +*
- *4 diver samples / day x 2 L drainage per diver sample =*
- *which total a maximum of* ***70 L*** *of potentially sediment-laden seawater per day.*

6.0 ENVIRONMENT

No field work was carried out in the reporting period.

7.0 REFERENCES

Bucci, L. 2012. Independent Technical Assessment of the assets of TNT Mines Limited. SRK Consulting Australasia Pty Ltd.

Duncan, D. McP. 2002. Exploration Licence T2-MEL, Ringarooma Bay Tasmania. Final report on exploration April 1998 to March 2002. Mineral Holdings Australia Pty Ltd. MRT open file report 02-4715.

Keserue-Ponte et al (in prep). Ringarooma Bay Mineral Exploration Environment Plan. Project No: 3998.001 SEMF Pty Ltd

Kinnane, N.R. 2001. Assessment Great Northern Plains Prospect North East Tasmania. Mineral Holdings Australia Pty Ltd. MRT open file report 02-4742.

Lucieer, V. et al. 2009. Seamap Tasmania – Mapping the Gaps, Final Report to NRM North, Tasmanian Aquaculture and Fisheries Institute, January 2009.

MacArthur, N.A. 1995. Pre-feasibility review, Ringarooma Alluvial Tin Project. Zephyr Minerals N.L. MRT open file report 95-3703.

Mason, A.J. 2000. Pre-feasibility review, Ringarooma Alluvial Tin Project. Zephyr Minerals N.L. MRT open file report 01-4547.

APPENDIX 1 – Ringarooma offshore tin mining project. Options and indicative costings

TNT MINES LTD

RINGAROOMA OFFSHORE TIN MINING PROJECT OPTIONS AND INDICATIVE COSTINGS

1. INTRODUCTION

This review of possible mining options and indicative costing for the Ringarooma Project in North East Tasmania was undertaken at the request of Mr Russell Fulton of TNT Mines. The briefing documents included a revised budget for marine survey together with printouts of location maps. Included in the printout was information that 'previous explorers (Mason 2000) estimated JORC compliant resources as:

Inferred: 194Mm3 at 150 – 250g/m3 of tin

Indicated: 16Mm3 at 227g/m3 of tin.'

This report has been prepared based on the limited information provided; the personal experience of the writer and his associates; and through contacts with suppliers and operators. For reasons of speed and economy no studies have been undertaken at the site and this will be crucial to any final selection of equipment and infrastructure as conditions offshore in Bass Strait can be severe, particularly during the Spring Equinox (Sept – Dec). Furthermore projected operating costs are based on historical Indonesian and Australian data (2006 – 2011) and considerable research would be required to develop a detailed working budget.

2. SUMMARY AND CONCLUSIONS

Based on the limited information available there are sufficient Indicated Resources (16Mm3 at 0.227kg/m3) to establish a four year dredging operation at 500m3/hour or 3.6Mm3/year. If further exploration activity upgrades the Inferred Resources there is opportunity for more than one dredge unit to operate in the area

Alternatively a smaller dredge unit 300m3/hour or 2.2Mm3/year could be considered in the Indicated Resource area at marginally lower capital and operating cost. In this case dredging income would be available over a seven year timeframe during which time further exploration could be undertaken. However the lower throughput in low grade ground and therefore lower production would not be sufficiently offset by cost savings and the operating profit at the lower tin price of AUD$20000 would at best be marginal.

The recommended mining option is a cutter suction unit. A 500m3.hour unit operating for 20 hours/day would mine 3.6Mm3 per annum and produce 816 tonnes of tin assuming a recovery on bore value of 100% and a grade of 0.22kg/m3.

Capex for setup would be in the order AUD$7.1M assuming a new self propelled dredge was purchased with an onboard concentrating plant, associated work boats, a wharf, breakwater and onshore office facility.

Operating profit from the sale of wet ore at 74%tin in concentrates would be in the order of AUD$3.0M/annum before overheads, tax, interest and royalties; assuming a wet concentrate sale price of AUD$14800 on an LME Tin Price of AUD$20000/Tonne.
Cost/m3 mined would be in the order of $2.50.

3. CHARACTERISTICS OF THE DEPOSIT

The deposits of cassiterite are contained in approximately 6 – 8m of offshore alluvium which originated in the Ringarooma River Catchment in North East Tasmania. According to the information provided the deposit extends for some 10kms offshore and varies in width from 1 – 3kms. The depth of water overlying the alluvium is in the order of 25 – 30m. The Ringarooma Catchment was extensively mined onshore in the late nineteenth and early twentieth centuries. The alluvium is likely to be fine grained unconsolidated sand and silt as the deposits are downstream effluent from the river system; and probably include tailings from early mining. There is little likelihood of vegetation other than seaweed, and possibly a few logs carried offshore during periods of heavy rain. It is also highly unlikely that heavy clays will be a problem, either for the cutter and pump or in terms of suspended solids.

The work done to date to define measured resources falls considerably short of that required to define mineable reserves. TNT mines Ltd have a stated intention to further define traps for mineralisation by geophysical and hydrographic surveys and by drilling programs.

The main issue from a mining standpoint will be the need to ensure that mining operations take cognisance of the adverse weather patterns that can result in strong winds and heavy seas.

4. MINING METHOD

When dealing with a large volume and low unit value deposit a low cost bulk mining method is required. The fact that the deposit is also offshore limits the selection to some form of dredging equipment. There are hydraulically operated submersible pump units available on the market. Sykes stock the ‘Dragflow’ series which have proved successful in many applications involving desludging of dams and estuarine harbours. However the depth of the Ringarooma offshore alluvium and difficulties in precise manoeuvrability of the pump under sea conditions precludes the consideration of ‘Dragflow’ type units for this project.

There are only two methods to consider: bucket line and suction cutter.

Bucket Line

This traditional form of dredger was developed in the nineteenth century and large numbers were manufactured in Europe for use in Asia, Australasia, and South America. At one stage more than fifty units were in operation in Malaysia. Indonesia still employs a number of bucket ladder dredges in offshore locations near Bangka Island. These units operating in the Asian environment were characterised by high volume throughput; high capital and low operating costs. Because of the huge breakout forces available at the cutting tumbler they were able to cope with stiff heavy clays. Second hand units are probably available ex Indonesia or Malaysia at bargain basement second hand prices. However in the current Australian industrial environment heavy spare parts will be difficult to procure in timely fashion and it will be expensive to find and train crews to undertake heavy bucket ladder maintenance on exposed decks in Bass Strait. Indonesian labour costs are significantly lower than those in Australia and bucket ladder dredges are a labour intensive option. The larger units capable of operating to depths of 40m will be in the order of 6000 tonnes displacement, have to be towed by a large seagoing tugboat and will therefore be difficult and expensive to move quickly should weather conditions deteriorate rapidly. Offshore dredgers of this type in Indonesia are relocated bi-annually to more sheltered locations as the monsoonal wind shifts occur.

There are also economies of scale in Indonesia with sufficient numbers of bucket ladder dredgers operating to allow for the provision of seagoing tugs; and for dry dock and foundry facilities to operate economically within the company framework.

Cutter Suction

These units have been successfully operated in the Australian environment for a number of decades. They have been used for harbour channel dredging all around the coastline, and for landfill and mining projects. There are a number of companies in Australia that construct cutter suction units for civil engineering projects in which the slurry is pumped to a tender barge for relocation away from the excavated trench; and for mining projects where the slurry is pumped ashore for treatment or to a nearby floating treatment plant connected to the dredger by floating pipeline.

There would be problems with utilising a satellite floating treatment plant in Bass Strait. It would be difficult to disconnect the plant from the dredge in deteriorating weather conditions and the dredge and the plant would have to be relocated separately should the situation require a move. Frequent moving and anchoring the two units and maintaining control of the pipeline at sea would be much more difficult than in a landlocked and sheltered lake. The configuration of the deposit precludes the construction and maintenance of a pipeline to convey the slurry to shore when the dredger could be up to 10kms from the coast. Such an installation even if possible would necessitate the construction of a system to treat and contain the huge volume of slurry on shore and to return the treated material to the seabed thereby significantly adding to the cost.

The depletion of resources and the decline of onshore tin mining industry in S.E.Asia have led to the development of a large offshore dredging industry located in Indonesian waters off Bangka Island in the South China Sea. Initially the industry utilised the services of the large bucket ladder dredges adapted for offshore work and P.T.Timah (the State owned mining company), operated some twenty such units. Increasingly and with some privatisation of the industry there has been a move to purchase a number of cutter suction units for this work. Shipyards in Thailand have undertaken contracts to build and deliver large self propelled cutter suction units with onboard treatment plants to upgrade the concentrates prior to removal to a shore based treatment plant by barge.

The cutter suction units have a number of advantages over the traditional bucket ladder dredges:

- They are smaller, self propelled and therefore easier to relocate
- Fewer large mechanical drives and less heavy equipment; leading to lower operating and maintenance costs and smaller spare part inventories.
- Smaller crew requirements, lower labour costs.
- Lower capex

Thai shipyards have led the development of these units for the Indonesian offshore dredging industry and a copy of a quotation and photographs are attached to this report.

From the quotation it may be seen that the construction period for a large dredger is one year from the placement of the order.

Alternative options would include the purchase of a second hand unit and subsequent modification of that unit to include an onboard treatment plant. Perusal of the websites of dredger brokers worldwide indicates there are many units available of the capacity required for Ringarooma. Investigation of these options, plant design and negotiations with shipyards would take considerable time and are beyond the scope of this report. Should further exploration prove considerable additional reserves/resources, the option for modification of a suitable second hand unit should be considered. However if more than one dredger unit were to be contemplated it would seem sensible for logistical and training purposes for the two or more units to be from the same stable.

Preparations for Dredging

It will be necessary to undertake onshore work at the site prior to the arrival of the dredge.

The coastline of N.E.Tasmania is rugged and Bass Strait is notorious for the rough weather that prevails when depressions and troughs move in from the west and South West particularly during the Spring Equinox (Sept – Dec).

On existing information the dredge could be operating up to 10kms offshore, necessitating the provision of workboats and a barge to ferry supplies, crews and concentrates between the shore and the dredge. There would have to be provision ashore for the workboats to load and offload, and this provision should include a wharf and craneage. In addition Ringarooma Bay is exposed to the North West onshore winds and it is considered that a breakwater should be provided on the western side of the bay to protect the workboats and provide shelter for the dredge should severe weather conditions prevail.

Without the benefit of detailed site surveys to locate a suitable location and hard rock resource, preferably at the western end of the bay, it is difficult to accurately cost this work. A simple provision has been made in the Capex costings for a 200m breakwater and a wharf with onshore storage for concentrates.

5. CAPEX

A copy of a quotation prepared for an Indonesian contract operator by Kriansek – Tomas Lew shipyards of Sumatsakorn in Southern Thailand for a 85m long self propelled cutter suction unit with onboard concentrating plant is attached to this report. The quote is for Thai baht 85,000,000 (Eighty five million) which at the current (2012) rate of exchange equates to $2.6 million AUD.

This quotation is for a dredge to operate off the coast of Bangka Island and such a unit may have to be modified to work in Tasmanian waters where it will be subject to Marine and Safety Tasmania regulation. To this cost must be added the requirements for the voyage to Tasmania and for crew training. Crew accommodation onboard will have to be upgraded to suit the Tasmanian climate. An additional provision of AUD1.4M is made for the upgrades.

The dredge that is the subject of the quote is equipped with screens, distributor and a jig plant for recovery of concentrates. This equipment is tried and tested for coarser grained, higher grade deposits in offshore Indonesian waters. There is limited information available on the nature of the Ringarooma deposit and it may be necessary to modify the circuitry for the Bass Strait operation.

In addition it will be necessary to purchase two workboats and a barge to act as tenders to the dredge. It will also be necessary to find a suitable location in Ringarooma Bay to construct a wharf and a breakwater in order that concentrates, crew and supplies may be loaded and offloaded safely and to provide a sheltered location for the mooring of the dredge for heavy maintenance and safety in the event of violent weather.

Subject to further sampling of the deposit decisions will have to be taken on whether or not to construct a further treatment plant on shore but in any event a storage facility will have to be constructed to safely house the concentrates prior to shipment.

Of these ancillary projects the wharf and the breakwater will be the most expensive. Even if materials are available locally the cost/m3 for earthmoving is unlikely to be less than $18 per tonne. Assuming an average water depth of 15m, a 10m crest, and a forty five degree rill angle a total volume of rock in excess of 75000m3 will be required for a 200m long breakwater. A further Capex requirement of AUD 1.85m should be allocated for this work.

The total Capex Requirement will therefore be in the order of AUD 7.15 million

• Basic Dredge	2,600,000
• Adaptions for Bass Strait/transfer to site and training	1,400,000
• Allowance for modifications to plant (See notes)	500,000
• Construction of breakwater and Shore Infrastructure	1,850,000
• Purchase of two workboats one barge and cranes	800,000

Note: These Capex requirements do not include figures for the provision of an onshore treatment plant (if required) nor do they include any land acquisition charges, all of which are beyond the scope of this report.

6. PRODUCTION CAPACITY

For the purposes of this exercise a single 500 m3/hr dredge has been used. Obviously and if future exploration programs increase the reserve/resource base additional units could be employed.

Production for a single unit operating for 20 hours/day, 365 days/year, in an average grade of 0.22kg/m3, is estimated at 816 tonnes per annum.

Mining recovery has been assumed at 100% throughout. Wet plant recovery on the dredge has been assumed at 74% tin in concentrates. In practice wet plant recovery varies from deposit to deposit. Indonesian bucket ladder dredges with primary, secondary and tertiary jig banks, with experienced crews and operating in relatively high grade coarse grain size deposits (>1kg/m3 and 80 – 120#) typically offloaded concentrates at 35 – 55% tin. In practice it is doubtful that a dredge operating in Bass Strait with lower grades; and probably fine downstream grain sizes will better the grade of concentrates produced by the Asian dredges without significant metallurgical input; possibly a consideration for spirals instead of jigs, and probably some form of concentrate upgrade on shore prior to shipment to the smelters. Such deliberations will require detailed analysis of samples taken from the deposit.

7. OPERATING COSTS

Attached to this report is a simple spreadsheet illustrating the main operating costs against production for a single unit operation.

Some basic assumptions that have been accepted are:

- The inferred Resource Figure (Mason, 2000) of 0.227kg/m3 is accepted for all material mined.
- Currency Exchange Rates for July 2012 are used.
- Projected LME tin price range is USD 20000 – 25000/tonne

Detailed research into the latest labour and spare parts inventory costs have not been within the scope of this report. Costs are based on recent (2007 – 2010) historical data for Indonesian and Australian operations and would have to be updated should there be a decision to proceed with the dredging program.

As expected the spreadsheet identifies that tin price, m3/hour dredged, grade, and exchange rate fuel price fluctuations are the variables with the most influence on the bottom line. Labour and spare parts inventories are likely to remain fairly constant. For a tin price in the range $20000 – 25000 the operating profit (before overheads, interest, royalties and tax) is likely to be in the range AUD$2.7m – AUD$5.7m per year.

As tax calculations have not been included in the spreadsheet the payback period on Capex can only be crudely assessed at approximately3 years

The projected cost/m3 mined is in the range AUD$2.3 – 2.5.

Roger Bastone
Mining Engineer
3096 Channel Highway Kettering

Tasmania 7155

5th August

Cutter suction dredge

Cutter suction head

			Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
General								
	USD to AUD Exchange Rate	AUD	1	1	1	1	1	1
	Days Per Month	Days	31	31	31	31	31	31
		18000						
Sales Prices								
	Base LME Tin Cash Sales Price USD	USD$ / Tonne	20,000	20,000	20,000	25,000	20,000	20,000
		AUD$/Tonne	20,000	18,000	21,000	25,000	20,000	20,000
	Tin Ore Concentrates - Wet Sales Price (74% of Base LME Cash Tin Sales Price)	US$ / Tonne	14,800	14,800	15,000	18,500	14,800	14,800
		AUD$/Tonne	14,800	13,320	15,750	18,500	14,800	14,800
Tin (Sn) Production	Number of Suction Cutter Dredgers Operating	Number	1	1	1	1	2	1
	Cubic Meters of Ore Processed Per Hour per Dredger	Cm / Hr	500	500	500	500	500	300
	WHO Grade	Kgs Sn / Cm	0.22	0.22	0.22	0.22	0.22	0.22
	Dredger Operating Hours per Day (per Dredger)	Hours / Day	20	20	20	20	20	20
	Tin (Sn) Production per Day per Dredger	Tonnes Sn/Day	2.20	2.20	2.20	2.20	2.20	1.32
	Sn Production per Month per Dredge	Tonnes Sn/Month	68	68	68	68	68	41
	Total Sn Production per Month - All Operating Dredgers	Tonnes Sn/Month	68	68	68	68	136	41
	Total Value Wet Sales Tin Ore Concentrates/Month	AUS$	1,009,360	908,424	1,074,150	1,261,700	2,018,720	605,616
Operating Costs								
Dredgers	Fuel Consumption per Hour (Cummings 895) - continuous power	liters / hr	250	250	250	250	250	180
	Cost of Fuel (Solar)	AUD / liter	1	1	1	1	2	1
	Total Fuel Cost per dredge	$ / Month	217,000	217,000	217,000	217,000	263,500	111,600
	Total Fuel Cost - all operating dredges	$ / Month	217,000	217,000	217,000	217,000	527,000	111,600
	Personnel per Dredge							
	Dredge Master	AUD / Month	16,000	16,000	16,000	16,000	32,000	16,000
	Dredge Captain	AUD/Month	14,000	14,000	14,000	14,000	28,000	14,000
	On-board Maintenace Supervisor	AUD/Month	12,000	12,000	12,000	12,000	24,000	12,000
	On-board Operating & Maintenance Crew (4 X 4 - shifts)	AUD/Month	240,000	240,000	240,000	240,000	480,000	180,000
	Day Crew (x 3)	AUD/Month	58,000	58,000	58,000	58,000	58,000	58,000
	Mess Cost	AUD/Month	40,000	40,000	40,000	40,000	80,000	30,000
	Maintenance Cost	AUD/Month	40,000	40,000	40,000	40,000	80,000	30,000
	Operating Supplies	AUD/Month	24,000	24,000	24,000	24,000	48,000	30,000
	Supply / Concentrate Offload Costs - 2-boats - 2 personnel per boat - 1 shift	AUD/Month	40,000	40,000	40,000	40,000	40,000	40,000
	On Shore Administration - 2 personnel (includes office supplies)	AUD/Month	18,000	18,000	18,000	18,000	18,000	18,000
	Shipping Charges Wet Concentrate	AUD/Month	50,000	50,000	50,000	50,000	100,000	50,000
	Insurance	AUD/Month	12,000	12,000	12,000	12,000	24,000	10,000
	Total operating Cost Per Month		781,000	781,000	781,000	781,000	1,539,000	599,600
	Profit/Month before tax/royalties/interest etc		228,360	127,424	293,150	480,700	479,720	6,016
	m3/Month		310,000	310,000			620,000	
	Cost/m3/Month		2	2			2	